Name: Date:

Polynomial Factoring solution (version 619)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 28 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(28)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 112}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-96}}{2}$$

$$x = \frac{-4 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{-4 \pm 4\sqrt{6}\, i}{2}$$

$$x = -2 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $8 + 6i$ and $5 - 2i$ in standard form ($a + bi$).**

Solution

$$(8 + 6i) \cdot (5 - 2i)$$

$$40 - 16i + 30i - 12i^2$$

$$40 - 16i + 30i + 12$$

$$40 + 12 - 16i + 30i$$

$$52 + 14i$$

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3. **Write function $f(x) = x^3 + 6x^2 + 11x + 6$ in factored form. I'll give you a hint: one factor is $(x + 1)$.**

Solution

	1	6	11	6
-1		-1	-5	-6
	1	5	6	0

$$f(x) = (x+1)(x^2+5x+6)$$

$$f(x) = (x+1)(x+3)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+8)^2 \cdot (x+3)^2 \cdot (x-2)^2 \cdot (x-5)$$

Sketch a graph of polynomial $y = p(x)$.